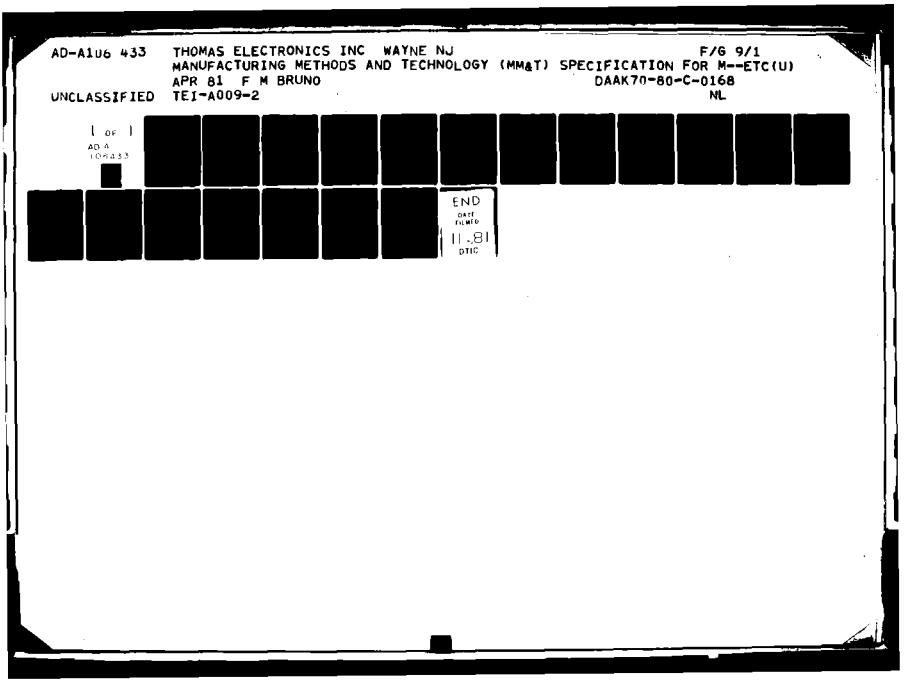
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Thomas Electronics, Inc.
100 Riverview Drive
Wayne, NJ 07470

SECOND QUARTERLY REPORT

for period

1 February 1981 - 31 March 1981

Approved for public release; distribution unlimited

Manufacturing Methods and Technology (MM&T) Specifications for Miniature Cathode Ray Tube

prepared by

F. M. Bruno

Thomas Electronics, Inc.
100 Riverview Drive
Wayne, NJ 07470

prepared for

Procurement and Production Directorate
USA MERADCOM
Fort Belvoir, VA 22060

THOMAS ELECTRONICS, INC.
100 Riverview Drive, Wayne, New Jersey 07470 / 201-696-5200 / TWX: 710-988-5836 / Cable: TOMTRONICS

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ACKNOWLEDGEMENT

This project has been accomplished as part of the US Army Manufacturing Methods and Technology (MM&T) Program which has as its objective the timely establishment of manufacturing processes, techniques, or equipment to insure the efficient production of current or future defense programs.

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Miniature cathode ray tube

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The 1st submission of one (1) Phase I - Engineering Sample is ready for shipment to the contractor's representative. Test Data Forms contain results obtained by TEI's Engineering and Quality Assurance Departments during inspection and testing.

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20. ABSTRACT (contd.)

Fabrication, test, and shipment of the 1st submission in Phase I - Engineering Samples occurred three months behind the scheduling in the contract because of alternate designs used for the neck shield and the deflection coil. It is anticipated that the time lag will be reduced during fabrication and test of the 2nd and 3rd submissions. Vendor delivery of critical components for the 2nd and 3rd submissions is scheduled for mid-April.

Preliminary drafting is going forward on some of the technical data documentation required during Phases I and II of the contract.

Manufacturing Methods and Technology (MM&T) Specifications for Miniature Cathode Ray Tube

SECOND QUARTERLY REPORT

for period

1 February 1981 - 31 March 1981

The object of this study is to develop design, performance, and test specifications for the Miniature Cathode Ray Tube (CRT) assembly suitable for use in the Integrated Helmet and Display Sight System (IHADSS) of the Army Advanced Attack Helicopter (AAH).

Contract Number: DAAK70-80-C-0168

Approved by:

M. L. Beasty
Vice President - Engineering

Approved by:

F. M. Bruno
Program Manager

Approved for public release; distribution unlimited.

ABSTRACT / SUMMARY

The 1st submission of one (1) Phase I - Engineering Sample is ready for shipment to the contractor's representative. Test Data Forms contain results obtained by TEI's Engineering and Quality Assurance Departments during inspection and testing.

Fabrication, test, and shipment of the 1st submission in Phase I - Engineering Samples occurred three months behind the scheduling in the contract because of alternate designs used for the neck shield and the deflection coil. It is anticipated that the time lag will be reduced during fabrication and test of the 2nd and 3rd submissions. Vendor delivery of critical components for the 2nd and 3rd submissions is scheduled for mid-April.

Preliminary drafting is going forward on some of the technical data documentation required during Phases I and II of the contract.

TABLE OF CONTENTS

1.0 PURPOSE

The purpose of this Manufacturing Methods and Technology (MM&T) contract is to establish production methods and facilities required to produce the Miniature Cathode Ray Tube Assembly required for the Integrated Helmet and Display Sight System of the Army Advanced Attack Helicopter.

The primary objectives are to develop vendor sources for the required individual components and establish viable production techniques to meet the necessary monthly production rate. The product produced will be required to meet the mechanical, electrical, performance, and environmental parameters of MM&T H799838.

2.0 GLOSSARY

CRT	Cathode Ray Tube
EM	Equipment Manufacturer
MM&T	Manufacturing Methods and Technology
TEI	Thomas Electronics, Inc.
TIR	Total Indicated Range

3.0 NARRATIVE AND DATA

3.1 Device

The TEI Part Number 1M40P43MFO has been assigned to the one inch CRT assemblies which will be fabricated for the Miniature CRT Assembly MM&T Program under Contract No. DAAK70-80-C-0168. To facilitate production of engineering samples, some stock materials available from a similar program were allocated for Phase I.

3.2 Structure

The miniature CRT assembly defined in MM&T H799838 consists of a miniature CRT, deflection coil, magnetic shield, anode lead and associated flying leads. The components are assembled, encapsulated, finished and tested in accordance with the processes and procedures to be detailed in future quarterly and other related reports.

3.3 Problem Areas and Solutions

Alternate designs for the neck shield and the deflection coil had to be presented to the EM and evaluated before the 1st submission of the Phase I - Engineering Samples could be fabricated, tested, and shipped to the Contracting Officer's Representative. A delay of three months occurred in the scheduling prescribed by the contract.

3.3.1 1st Submission of Phase I - Engineering Samples

The 1st submission of Phase I - Engineering Samples, with an engineering test report, is ready for shipment to the designated addressee. Prior to March 31, 1981, the following developments took place:

Components such as electron gun parts, funnel necks, fiber optic faceplates, shields, leads and yoke were inspected and incorporated in the fabrication of the electron gun, CRT, and the first CRT assembly.

The CRT assembly was assembled using a prototype yoke as noted in the monthly report, and had a rear shield diameter in excess of the specified 15 mm so that the anode lead could also be encapsulated inside the neck shield; the potted base had a truncated cone shape.

The 1st submission will be accompanied by TEI Test Data Form TDF-917 which contains the Category I requirements and tests of MM&T H799838 with values recorded by TEI's Engineering and Quality Assurance Departments during final inspection.

Two parameters exceeded the maximum limits in the specifications.

(1) Maximum length of the overall CRT assembly (exclusive of flying leads): Specified 95.25 mm; actual 95.70 mm.

(2) Neck shield diameter: Specified 15 mm; actual 19.43 mm. The anode lead is encapsulated in the neck shield. Overall diameter of the neck shield is less than the allowable

20.32 mm diameter maximum for this zone; when checked for TIR, was within .12 mm of the maximum dimension.

In addition to the test data required by the contract, TEI also will supply test results of electrical parameters such as cutoff, heater current, voltage breakdown, electrode leakage, light output and line scan per slit scan method using a Gamma Scientific Scanning Microphotometer, anode current, focus current and voltage, modulation, gas ratio, and spot position.

3.3.2 2nd Submission of Phase I - Engineering Samples

The two (2) samples for the 2nd submission of Phase I - Engineering Samples must meet Category I and II requirements of MM&T H799838. Component parts are being fabricated for the 2nd submission CRT assemblies. The present gating items are the yokes and the funnel necks. Yokes which will meet the MM&T requirements are being designed and manufactured. Since the yoke inside diameter is smaller than the present funnel neck outside diameter, a new funnel neck (bulb) design was required. The new design was submitted to TEI's vendor for proposals.

Fabrication and test of the 2nd and 3rd submissions of Phase I - Engineering Samples will be scheduled to proceed as soon as TEI obtains the following items:

(1) Yoke intended to meet MM&T specifications. Anticipated delivery date is April 17, 1981.

(2) Modified funnel necks. Anticipated delivery is the week of April 20, 1981.

3.3.3 Technical Data, CLIN 0003

Preparation and delivery of the first monthly status report and the draft of the first quarterly report were delayed because of design alterations required before the 1st submission of Phase I - Engineering Samples could be fabricated, tested, and shipped. It is anticipated that future contract data requirements A007 (Monthly Status Report) and A009 (Quarterly Report) will be on schedule.

Contract data requirement A012 (Engineering Sample Test Plan) is being drafted; the required test forms are being assembled; and a test schedule is being prepared.

Two of the contract data requirements for Phase II - Confirmatory Samples are being readied in draft and outline form.

(1) For contract data requirement A002 (Type D, Specifications), pertinent documents are being prepared and assembled as the Engineering Samples are being fabricated.

(2) For contract data requirement A003 (Drawings, Engineering and Associated List), personnel are being assigned with anticipated schedules for the necessary art and drafting work.

3.3.4 Testing

For environmental testing of the Phase II - Confirmatory Samples, TEI's Quality Assurance Department has begun work on a first draft of the test procedure. Also, TEI has ordered

power supply equipment to operate the CRT samples during the Phase II environmental testing.

A test file has been established for Phases I, II, and III to include original log sheets and diagrams such as wiring, schematic or block, necessary to describe completely the purpose, conduct, and results of tests. This file has been given a permanent identifying number which will appear on all documents associated with every particular test.

3.4 Process, Equipment, and Tooling

Some of the CRT parts and procedures have been subdivided as follows (each will be presented in greater detail in later periodic reports or in related technical data line items):

3.4.1 Funnel Neck

3.4.2 Fiber Optic Faceplate

Processes include phosphor coating, trimming, lacquering, and aluminizing.

3.4.3 Upper and Lower Shield

3.4.4 Deflection Coil

3.4.5 Leads

Color coded leads are required for the anode, focus, grid #2, cathode, grid #1, and heaters.

3.4.6 Potting Material

4.0 CONCLUSIONS

The 1st submission of Phase I - Engineering Samples, with test data, is ready for shipment to the designated addressee and fabrication of the 2nd and 3rd submissions in Phase I can proceed as necessary components are delivered by TEI's vendors.

The seventeen technical data items that are required at specified periods during the life of the contract, have been organized and scheduled; and it is planned to deliver them in the correct format, in the desired number of copies, at the specified times.

TEI estimates that overall progress on major elements of the project is approximately 5%.

5.0 PROGRAM FOR NEXT INTERVAL

The program for the next quarter is as follows:

1. Prepare and submit monthly status reports and also the draft and final quarterly report.
2. Fabricate, test, and ship the 2nd submission of Phase I - Engineering Samples.
3. Prepare and submit technical data required for Phase I - Engineering Samples: A012, Engineering Sample Test Plan.
4. Establish and maintain a test file for all forms and documents related to each particular test so the test data can be included in A015, Engineering Sample Test Report.
5. Continue preparation of technical data required prior to the start of Phase II - Confirmatory Samples: A002, Type D, Specifications, and A003, Drawings, Engineering and Associated Lists.

6.0 IDENTIFICATION OF KEY PERSONNEL

Vice President of Engineering	Michael L. Beasty
Program Manager	Fred M. Bruno
Project Engineer	Michael Ardis, Jr.
Applications Engineer	Dennis Young
A. Process Engineer	Ronald Berdan
B. Process Engineer	Sandor Szanyi
Design Engineer	Emil Sanford
Glass Engineer	Peter Kohut
Quality Assurance Manager	Jake Brain
Technical Data Writer	Anne M. Stommel

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